

CLAIMS

1 1. A digital camera system having a digital camera and a computer for transferring
2 pictures of images taken by the digital camera therebetween comprising:

3 a card removably and directly coupled, without any intermediary device, between the
4 digital camera and the computer for temporarily storing the images by the digital camera and
5 for transferring the temporarily stored images to the computer for viewing, editing and
6 reproduction thereof.

1 2. A digital camera system as recited in claim 1 wherein the card is removably coupled to
2 the computer for transferring the images in a serial fashion to the computer.

1 3. A digital camera system as recited in claim 2 wherein the card is removably coupled to
2 the computer for transferring the images using a Universal Serial Bus (USB) interface.

1 4. A digital camera system as recited in claim 3 wherein the card is removably coupled to
2 the digital camera for transferring the images, in digital and parallel fashion.

1 5. A digital camera system as recited in claim 4 wherein the card is removably coupled to
2 the digital camera for transferring the digital parallel images using a PCMCIA/CF interface.

1 6. A digital camera system as recited in claim 5 wherein the card includes an interface
2 module for receiving the digital parallel images through the PCMCIA/CF interface and
3 converting the same to the serial digital images for transfer thereof to the computer.

1 7. A digital camera system as recited in claim 6 wherein the transfer of the serial digital
2 images is performed pursuant to the Universal Serial Bus (USB) standard.

1 8. A digital camera system as recited in claim 7 wherein the card further includes flash
2 memory coupled to the PCMCIA/CF interface and the interface module for temporarily
3 storing the digital images.

1 9. A digital camera system as recited in claim 8 wherein the card further includes a
2 common logic block for transferring the digital images between the flash memory and the
3 PCMCIA/CF interface and for further transferring the digital images between the interface
4 module and the flash memory.

1 10. A digital camera system as recited in claim 9 wherein the common logic block is
2 shared between the PCMCIA/CF interface and the interface module thereby avoiding
3 duplication of the common logic block.

1 11. A digital camera system as recited in claim 10 wherein the common logic block
2 includes a microcontroller block for processing information received from the computer,
3 through the interface module, and the digital camera, through the PCMCIA/CF interface, the
4 common logic block further including a data buffer for temporarily storing digital images
5 retrieved from the flash memory, a task file for storing commands received from the digital
6 camera and the computer, and a CIS RAM/ROM for storing identification information.

1 12. A digital camera system as recited in claim 11 wherein the interface module includes
2 an application interface for initiating communication between the computer and the
3 microcontroller.

1 13. A digital camera system as recited in claim 12 wherein the USB standard is defined to
2 include a first mode of application specifying a first data transfer mode and a second mode of
3 application specifying a second data transfer mode, the interface module including a USB
4 engine coupled to computer and the application interface wherein the USB engine operates to

accommodate said first and second modes of application without the need for any modifications to the card.

14. A digital camera system as recited in claim 13 wherein the first mode of application is ATA and the second mode of application is bulk-only mass storage class.

15. A digital camera system as recited in claim 14 wherein the interface module further includes a transceiver coupled between the computer and the USB engine for converting digital images to analog images for transfer to the computer and for further converting analog images to digital images for transfer to the digital camera, the interface module further includes a serial interface engine for converting digital images in serial fashion to digital images in parallel fashion and for further converting digital images in parallel fashion to digital images in serial fashion.

16. A digital camera system as recited in claim 1 wherein the computer includes a screen viewable by a user of the computer wherein an icon is shown thereupon when the card is coupled to the computer and the icon is not shown on the screen when the card is removed from the computer.

17. A card for use in a digital camera system, the digital camera system having a digital camera and a computer for transferring pictures of images taken by the digital camera between the digital camera and the computer comprising:

a controller for controlling the transfer of images between the digital camera and the computer by transferring images, in digital format, to the digital camera through a first interface and for transferring the images to the computer through a second interface; and

flash memory for temporarily storing the images, wherein the card is removably and directly coupled, without any intermediary device, between the digital camera and the computer for temporarily storing the images and for transferring the temporarily stored images to the computer for viewing, editing and reproduction thereof.

1 18. A card for use in a digital camera system as recited in claim 17 wherein the first
2 interface is a PCMCIA/CF interface and the second interface is a USB interface.

1 19. A card for use in a digital camera system as recited in claim 18 wherein the controller
2 includes a first interface module for causing communication between the card and the digital
3 computer through the PCMCIA/CF interface, a second module for causing communication
4 between the card and the computer through the USB interface and a third module coupled to
5 the first and second modules for causing images to be transferred to the flash memory.

1 20. A card for use in a digital camera system as recited in claim 19 wherein the computer
2 includes a screen viewable by a user of the computer, the card for causing an icon to be shown
3 on the screen when the card is coupled to the computer and for further causing the icon not to
4 be shown on the screen when the card is removed from the computer.

1 21. A card for use in a digital camera system as recited in claim 19 wherein the card
2 further includes a common logic block for transferring the digital images between the flash
3 memory and the first module and for further transferring the digital images between the
4 second module and the flash memory, wherein the common logic block is shared between the
5 first module and the second module thereby avoiding duplication of the common logic block.

1 22. A card for use in a digital camera system as recited in claim 21 wherein the common
2 logic block includes a microcontroller block for processing information received from the
3 computer, through the second module, and information received from the digital camera,
4 through the PCMCIA/CF interface, the common logic block further including a data buffer for
5 temporarily storing digital images retrieved from the flash memory, a task file for storing
6 commands received from the digital camera and the computer, and a CIS RAM/ROM for
7 storing identification information.

1 23. A card for use in a digital camera system as recited in claim 22 wherein the USB
2 standard is defined to include a first mode of application specifying a first data transfer mode
3 and a second mode of application specifying a second data transfer mode, the interface
4 module including a USB engine coupled to computer and the application interface wherein the
5 USB engine operates to accommodate said first and second modes of application without the
6 need for any modifications to the card.

1 24. A card for use in a digital camera system as recited in claim 23 wherein the first mode
2 of application is ATA and the second mode of application is bulk-only mass storage class.

1 25. A card for use in a digital camera system as recited in claim 24 wherein the second
2 module further includes a transceiver coupled between the computer and the USB engine for
3 converting digital images to analog images for transfer thereof to the computer and for further
4 converting analog images to digital images for transfer thereof to the digital camera, the
5 second module yet further includes a serial interface engine for converting digital images in
6 serial fashion to digital images in parallel fashion and for further converting digital images in
7 parallel fashion to digital images in serial fashion.

1 26. A method of transferring pictures of images taken by the digital camera between a
2 digital camera and a computer comprising:
3 providing images in digital format to the digital camera through a first interface;
4 temporarily storing the digital images in flash memory; and
5 transferring the stored images to the computer through a second interface directly and
6 without any intermediary device, between the digital camera and the computer.